LWS MOWG
Chair's opening remarks

Joe Mazur

The Aerospace Corporation

Space Sciences Department/Chantilly

joseph.mazur@aero.org **703-324-8915**

Topics

- Members
- Agenda & logistics
- My background and aims for the meeting
- Past findings
- Discussion items

Membership: and then there were 10?

Name		Affiliation	email	Phone
Joe	Mazur, chair	The Aerospace Corporation	joseph.e.mazur@aero.org	703 324 8915
Spiro	Antiochos	NRL	santiochos@solar.stanford.edu	202 767 6199
Sarbani	Basu	Yale University	basu@astro.yale.edu	203 432 3028
Paul	Bellaire	NSF	pbellair@nsf.gov	703 292 4713
Joseph	Davila	GSFC	davila@lindsay.gsfc.nasa.gov	301 286 8366
Tamas	Gambosi	University of Michigan	tamas@engin.umich.edu	734 764 7222
Michael	Golightly	AFRL	michael.golightly@hanscom.af.mil	781 377 3160
Don	Hassler	SWRI, Boulder	hassler@boulder.swri.edu	303 546 0683
Jeff	Kuhn	University of Hawaii	kuhn@pelea.ifa.hawaii.edu	808 956 8968
Judith	Lean	NRL	jlean@ssd5.nrl.navy.mil	202 767 5116
Tony	Manucci	JPL	tony.mannucci@jpl.nasa.gov	818 354 1699
Glenn	Mason	JHU/APL	glenn.mason.jhuapl.edu	240 228 2805
Terry	Onsager	NOAA	terry.onsager@noaa.gov	303 497 5713
James	Spann	MSFC	jim.spann@nasa.gov	256 961 7512
Harlan	Spence	Boston University	spence@bu.edu	617 353 7421

Agenda

Monday, May 1, 2006

8:30 AM	Chair's opening remarks, findings from last meeting, plan for this meeting	Joe Mazur
8:50 AM	Role of MOWG in advisory committees	Barbara Giles
9:25 AM	LWS program management	Mary DiJoseph & Chris St. Cyr
9:45 AM	Break	
10:05 AM	LWS program status	Lika Guhathakurta
	Questions and discussion of inputs to Science Subcommittee meetings 3-4	All
11:05 AM	May 2006	
12:00 PM	Lunch	
1:30 PM	LWS SET status	Dana Brewer
2:00 PM	Group discussion: Systems science, Global climate, LWS role in Exploration, L1 monitor, other topics of interest	All
4:00 PM	Writing assignments	All
	Group Dinner?	

Tuesday, May 2, 2006

8:30 AM	Chair's remarks – highlights from first day and drafts of findings	
8:50 AM	TR&T steering team report	Tamas Gambosi (via telecon)
9:30 AM	TR&T status & focused science	Dave Sibeck
9:50 AM	Break	
10:10 AM	Sentinels - preliminary science definition report	Adam Szabo
10:40 AM	Outreach & education	Eric Christian
11:00 AM	Questions and discussion	All
11:45 AM	Lunch	
1:00 PM	Division director's remarks	Dick Fisher
2:00 PM	Discussion of inputs to Science Subcommittee meetings; plans for the next MOWG meeting	All

My background & interests

- **Current position: lab manager, The Aerospace Corporation**
- **Experience:**
  - Co-I SAMPEX, Ulysses
  - Instrument investigator for ACE
  - PI environmental sensor for TWINS
  - CO-I LRO
- **Science interests**
  - solar energetic particle acceleration and transport
  - trapped particles in the Earth's magnetosphere
- **LWS-related interests**
  - Environment effects on space systems
  - Next-generation radiation belt models

Space Environment Hazards

Space hazard		Spacecraft charging		Single event effects			Total radiation dose		Surface degradation			Plasma interference with spacecraft communication	
	Specific cause	surface	internal	galactic cosmic rays	trapped radia-tion	solar particle	trapped radia-tion	solar particle	surface dose	ion sputter-ing	atomic oxygen erosion	scintil-lation	wave refract-ion
ORBIT	LEO <60°					N/A							
	LEO >60°												
	MEO										N/A		
	GPS				N/A						N/A		
	GTO										N/A		
	GEO				N/A						N/A		
	HEO										N/A		
	Inter-planet-ary	N/A	N/A		N/A		N/A		N/A		N/A		

Table key:

important

relevant

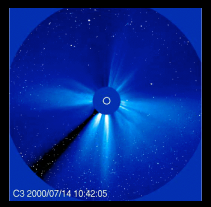
N/A: not applicable

J. Mazur, Crosslink, vol. 4, no. 2, Summer 2003

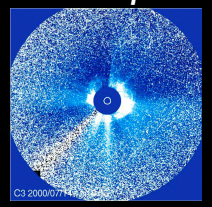
Major Spacecraft Hazards

False stars in star tracker CCDs

Before



During exposure to multi-MeV protons



Before *After*

Solar array power decrease due to radiation damage

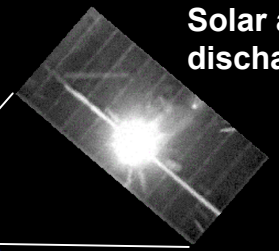
Surface degradation from particle radiation and photons

Single event effects in microelectronics

1101 ⇒ 0101

Electronics degrade due to total radiation dose

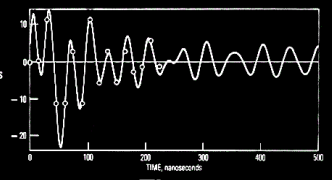
Solar array arc discharge



Spacecraft components become radioactive

Electromagnetic pulse from vehicle discharge (on surface, behind thin shielding, or deep inside)

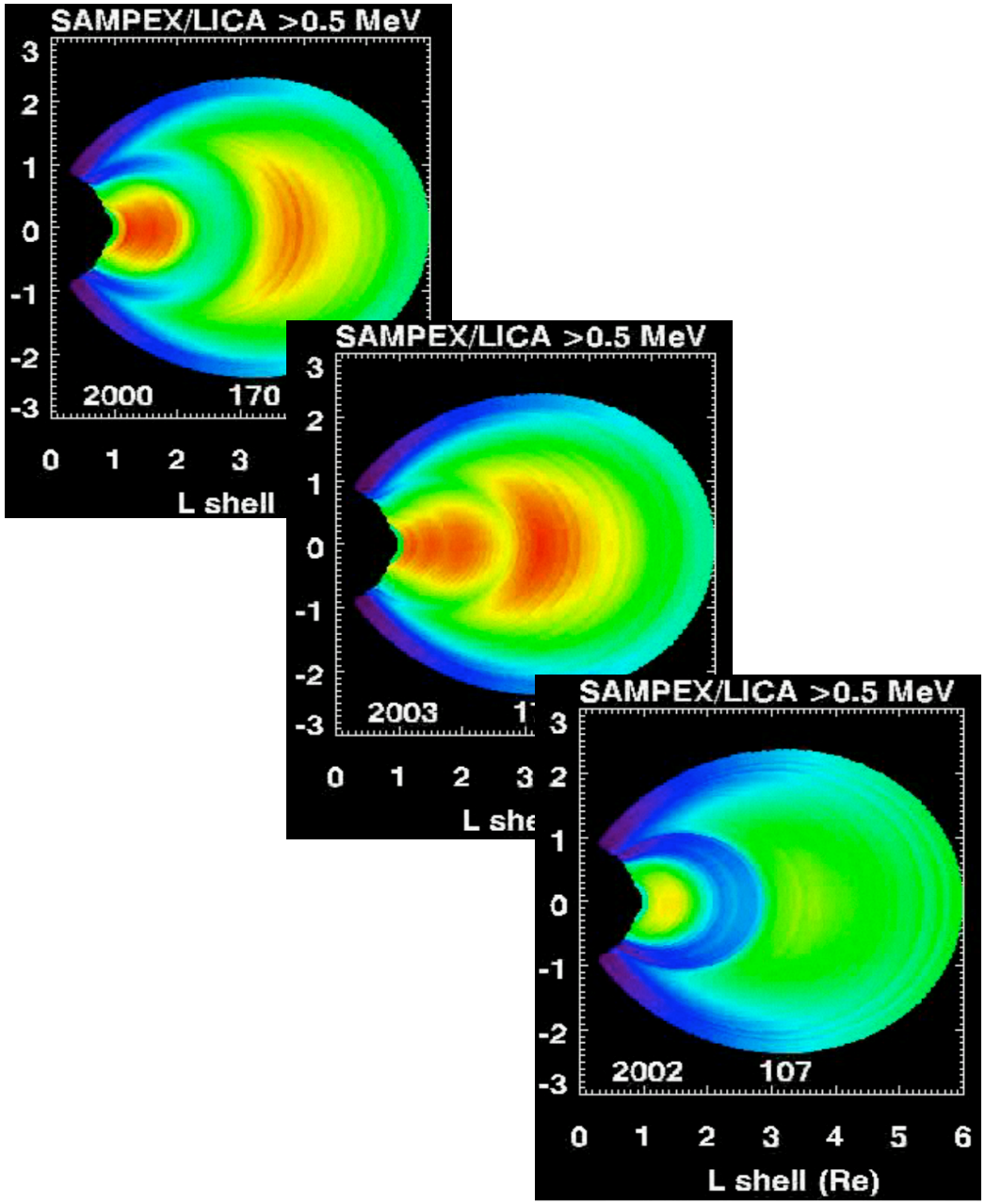
Induced Voltage



Time

(The Aerospace Corp.)

The Earth's Magnetosphere: Dynamics



- The two-radiation belt description of the magnetosphere depends on when one looks and at what particle energy
- New radiation belts of magnetospheric and solar origin sometimes form during magnetic storms
- These new belts sometimes contain heavy ions as well as protons and electrons
- New belts can also form in high-altitude nuclear bursts
- These are frames from a movie of ~0.5 MeV electrons and ~0.7 MeV protons from LEO extrapolated to high-altitude

Findings from past LWS MOWGs: June 2004

1. Low cost implementations to insure integrated & concurrent observations (e.g. follow PI-mode cost capped Explorers)
2. Need to use SEC missions for LWS goals, so determine what it costs for their MO&DA
3. Workforce development
4. Promote LWS to NASA Exploration
5. Reduce launch costs via ride-share and converted ICBMs
6. Parterships are good (ESA/NASA, DOD/NASA)
7. Pursue missions of opportunity
8. Support the PICARD mission
9. Advance Sentinels science with existing & upcoming interplanetary vehicles

Findings from past LWS MOWGs: Feb 2005

1. Sudden termination of operating missions in FY06-07 (Voyagers, FAST, Polar, Ulysses…) should not be allowed to occur
2. Assess the impact to systems science routinely in the Senior Review process
3. Supported the move of LWS data architecture environment to HQ MO&DA & development of SEC virtual observatories
4. Strong endorsement of solar probe, recommend the start of engineering studies to meet 2013 launch date
5. Endorse Sentinels definition team & proposed spiral development
6. TR&T partnerships with NCAR, NSF should occur without distorting the program
7. Concern about the growing lack of overlap between SDO & other LWS missions and impact to coupled science
8. Encouraged NASA to work with NSF to realize the ATST (advanced technology solar telescope)

Discussion items from 21 April telecon

General area	Specific topic	Notes
Function of LWS	Systems science	Revisit how program and budget realities have impacted plan for concurrent measurements (simultaneity may never happen as envisioned in LWS SAT) and resulting impact on LWS. Potential mitigation using existing assets and plans for multi-point measurements via hosts (e.g. GPS receivers).
	Global climate	Relationship of LWS with Earth Science Division given the split at the Division level; need LWS system science to address climate
	Role in Exploration	Clarify the links between LWS and the Exploration Program
	L1 monitor	Post-ACE plan; any role of new technologies such as solar sails

Community Survey

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1. Community Survey of NASA Priorities

From: Mark Sykes <sykes at psi.edu>

Dear SPA Planetary Scientists:

You are invited to participate in a short (6 questions), community-wide survey to determine how NASA solar system exploration activities should be prioritized in the face of substantial budget cuts right now, with the prospect of flat or decreasing funding in coming years. Go to

http://www.psi.edu/~sykes/nasa_priorities_survey

password = science

The survey will close Saturday, April 22, at 11:59 PM PST.

In its initial FY06 Operating Plan, submitted to Congress last February, NASA proposes to transfer monies from solar system exploration in particular and science overall to help fund the next generation crewed spacecraft and the Vision for Exploration (Moon-Mars Initiative). Research programs are specially singled out for immediate reductions.

Your letters to Congress, public statements, the testimony of our colleagues, and strong statements by members of Congress have successfully delayed the implementation of these cuts by holding up the approval of the initial FY06 NASA Operating Plan. There is hope (no guarantee) that Congress may tell NASA to restore these cuts, given the damage they pose to present and future capabilities of the United States in space science.

In the meantime, it is critical that Congress (and NASA) understand how programs should be prioritized in order to ensure that core programs are preserved while the future of NASA science and American solar system exploration are debated.

The decadal surveys are held up as fundamental guiding documents for science priorities within classes of missions, because they represent the "consensus of the community". Such a consensus of priorities across classes is needed. This survey seeks to demonstrate whether such a consensus already exists and what that is.

Your opinion is important.

This survey is being conducted by the Planetary Science Institute, a private non-profit corporation, and is co-sponsored by the Lunar and Planetary Laboratory of the University of Arizona.

Results will be posted at http://www.psi.edu on Sunday, April 23. Please distribute this invitation to your SPA and planetary colleagues who have not received it.

Mark Sykes,
Director
Planetary Science Institute

Science Subcommittees for NAC (Wed & Thurs)

NASA Advisory Council Science Subcommittees Planning Conference

[Federal Register: April 12, 2006 (Volume 71, Number 70)] [Notices] [Page 18777-18778] From the Federal Register Online via GPO Access [wais.access.gpo.gov] [DOCID:fr12ap06-115]

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

[Notice 06-025]

NASA Advisory Council Science Subcommittees Planning Conference

AGENCY: National Aeronautics and Space Administration.

ACTION: Notice of meeting.

SUMMARY: The National Aeronautics and Space Administration (NASA) announces a Planning Conference of the Science Subcommittees of the NASA Advisory Council (NAC). These Subcommittees report to the Science Committee of the NAC. The Conference will be held for the purpose of soliciting from the scientific community and other persons scientific and technical information relevant to program planning.

DATES: Wednesday, May 3, 2006, 8 a.m. to 6 p.m. and Thursday, May 4, 2006, 8 a.m. to 2:30 p.m., Eastern Daylight Time.

ADDRESSES: University of Maryland Inn and Conference Center, located at 3501 University Blvd. East, Adelphi, MD.

FOR FURTHER INFORMATION CONTACT: Ms. Lisa May, Science Mission Directorate, NASA Headquarters, Washington, DC 20546, (202) 358-2411 or lisa.may@nasa.gov.

SUPPLEMENTARY INFORMATION: The Planning Conference will feature plenary session information briefings by NASA officials on science program status and plans and the NASA FY 2007 budget proposal. The plenary session will subsequently breakout into meetings of the Astrophysics Subcommittee, Earth Science Subcommittee, Heliophysics Subcommittee, and Planetary Sciences Subcommittee. The breakout sessions will focus on: (1) Research and Analysis plans and program mix options, and (2) science community involvement in preparing the NASA Science Plan.

The meeting will be open to the public up to the seating capacity of the rooms. Thirty minutes will be set aside for verbal comment by members of the general public, not to exceed three minutes per speaker, at 8 a.m. on May 4, 2006. Those wishing to speak must sign up at the meeting registration desk by 6 p.m. on May 3, 2006. Members of the public are also welcome to file a written statement at the time of the meeting. Verbal presentations and written comments should be confined to the subject of priorities and program mix in NASA's space and earth science programs. Findings and recommendations developed by the Subcommittees during the Conference will be submitted to the Science Committee of the NAC.

It is imperative that the meeting be held on these dates to accommodate the scheduling priorities of the key participants. Attendees will be requested to sign a visitor's register.

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